

XVI.—Siphonaptera from Borneo. By DR. K. JORDAN and the late HON. N. CHARLES ROTHCHILD, M.A.

The collection of Siphonaptera submitted to us for study by Dr. E. Mjoberg consists of four species obtained by him on a recent expedition to Mt. Murud and Mt. Dulit. So little is known of the Bornean Siphonaptera that no fewer than three out of the four species are new to science. As was to be expected these new fleas are nearly related to forms described from other parts of the Malayan subregion.

Dr. Mjoberg has kindly permitted us to retain the types for our collection, which will ultimately be incorporated in that of the British Museum.

1. CTENOCEPHALUS CANIS Curtis (1826).

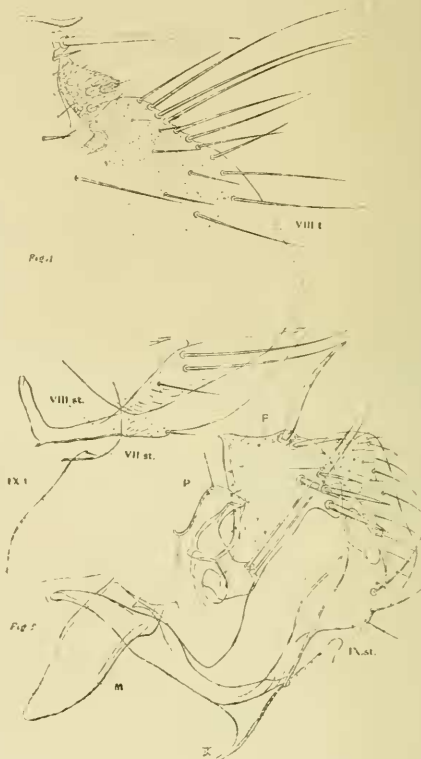
One specimen found in the jungle at Mt. Dulit, 3500 feet.

2. CERATOPHYLLUS CORNEENSIS nov. sp. (Figs. 1, 2, 3).

♂ ♀. Closely related to *C. agathus* J. & R., Ectoparasites 1, p. 225, No. 6, text fig. 219 (1922), from Sumatra, which is only known from a single ♀ obtained by E. Jacobson. The present species differs in the tail end.

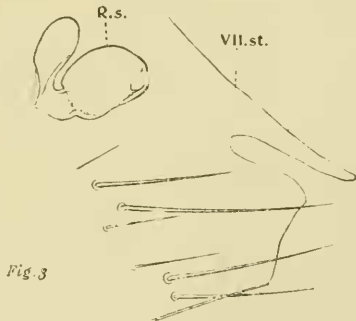
♂. Seventh abdominal tergite with a short median dorsal process, which, in a lateral aspect, is slightly lanceolate. Eighth tergite (fig. 1) large, as in *C. idoneus* Roths (1919), *C. fimbriatus* J. & R. (1921) and allied species, bearing a dorso-apical row of 9 to 11 bristles, 5 to 7 lateral ones, and

ventrally two long bristles, accompanied in one of the two ♂ before us by a small bristle. Eighth sternite (viii. st.) with a short narrow manubrium directed upward, one on each side; from this vertical portion distad the segment is for a short distance narrow and undivided, then divided into two ovate-lanceolate lobes, one on each side, which distally become membranous, and bear proximally a small ventral bristle each; the margins are entire, not fringed. As in *C. levis* J. & R. (1922), the ninth tergite (fig. 2, ix. t.) dorsally much less produced cephalad than in *C. idoneus*, *C. hastatus*, *C. fimbriatus*, etc. The manubrium (M) without hump dorsally at the base; the non-movable process P of the clasper (CE) twice as long as broad; its apex rounded on the anterior side, whereas the posterior apical angle projects as a short nose; the two acetabular bristles, slender and moderately long, close together on a slight projection at the ventral distal angle of the clasper; from this point frontad the body of the clasper widens and then its margin quite abruptly turns dorsad. The movable exopodite F widest apically, narrowest at the base, its dorsal frontal angle about 90° , with the tip produced into a short projection, the apical distal margin rounded, with the ventral angle widened downward as a short lobe; the exopodite bears six large spiniform bristles, two being placed above the middle of the posterior



margin, of which the upper one is the longest of all, and the second the smallest, the four others placed further down, three of them in a vertical row near the margin, and the fourth on the side near the uppermost of the three. Vertical arm of ninth sternite (ix. st., fig. 2) slender, ventrally gradually curving anad, widest below the manubrium M, the apex acuminate or subacuminate, and pointing dorsad-cephalad; ventral arm basally narrow, widened ventrally before middle into a rounded hump which bears a row of 4 to 6 bristles, the two posterior ones of them the strongest; from the most ventral point of this hump or lobe to the apex the sternite about three times as long as broad, and slightly curved upward, with the apex rotundate-truncate; this apical portion of the ninth sternite is studded with numerous short bristles, and bears at some distance from the ventral margin a row of 7 or 8 longer bristles; the dorsal margin is straight apically, and then obtusely angulate, near this angle a bristle which is rather smaller than the longish subventral ones of this sternite. Anal sternite long, widest proximally of middle, with a row of nine long slender bristles along the dorsal margin.

♀. Seventh sternite (fig. 3, vii. st.) deeply sinuate, the sinus much narrower than in *C. agathus*, the lobe above the sinus somewhat narrower, and projecting much more anad than the lower lobe, which is broad, obliquely truncate, with the apical margin slightly incurved. Receptaculum seminis (R.s.) with a longer head than in *C. agathus*.



Two ♂ and one ♀ from Mt. Murud off *Sciurus jentinki*, 28th September, 1922.

3. *STIVALIUS MJÖBERGI* nov. spec. (Figs. 4, 5).

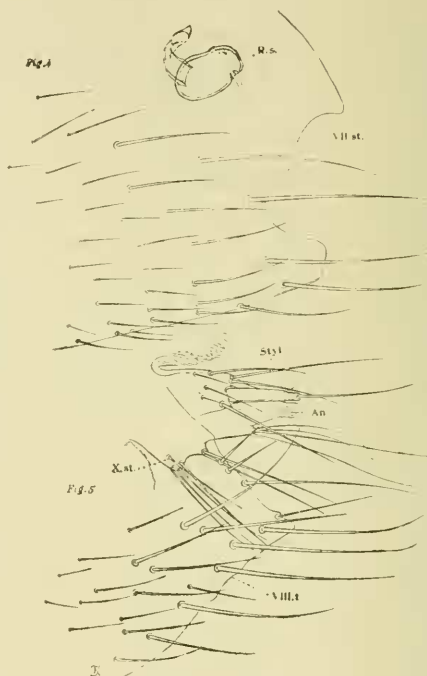
♀. This is a species with two combs on the abdomen. It is closely related to *St. jacobsoni* from Sumatra, which has only one abdominal comb (similar to the prothoracic comb) and is smaller. Chaetotaxy almost alike in the two species.

Rostrum reaching to apex of forecoxa. Comb of second abdominal tergite containing 16 spines (on the two sides together), that of third tergite 8 spines, the fourth tergite having one short spine on one side and two on the other. Marginal angle of tergite vii. below antepygidial bristles more strongly rounded than in *St. jacobsoni*. Lobe above sinus of seventh sternite (fig. 4) acuminate, its lower edge incurved, the ventral lobe broader than in *St. jacobsoni*, rounded at apex. Anal sternite (fig. 5) with long bristles only, namely a proximal bunch of 5 (in this specimen), a middle pair, and two apical pairs, on the two sides together, the sternite being twice incurved ventrally, i.e., slightly so behind the proximal bristles, and again more distinctly behind the middle pair. Receptaculum seminis (R.s.) of a different type, more nearly resembling that of *St. synctus* J. & R. (1922), its head widest near the tail, and its dorsal surface concave behind middle. Hind femur with two subapical ventral bristles on the outer surface. Tibiae with fewer large dorsal bristles, the shorter dorsal bristles not forming a sort of comb as in *St. jacobsoni*.

Length 4.3 mm. (mounted specimen).
 One ♀ from Mt. Murud off *Tupaia montana baluensis*.

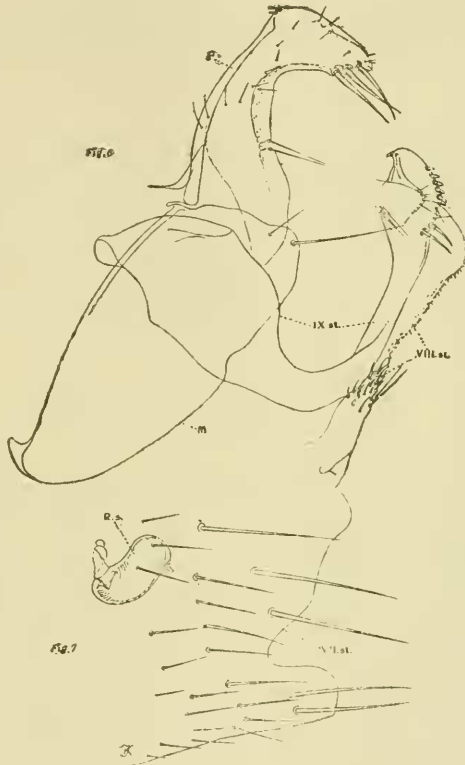
4. *STIVALIUS RHAEBUS* nov. spec. (Figs. 6, 7).

Allied to *St. robinsoni* Roths., 1905.



♂. Eighth abdominal sternite (fig. 6) ventrally below the ninth sternite with a spinose process, which is much shorter than in *St. robinsoni*; no other species besides these two is known to have a similar process. Exopodite F more strongly curved, the neck narrower, the apical portion larger, a ventral row of three large bristles close to apex, proximally to this row one or no ventral bristle, near the margin of the eighth sternite two slender ventral bristles.

Ventral arm of ninth sternite (ix. st.) with a very short, apical, tooth-like, upward projection; at ventral margin near apex a row of five short blunt spines and proximally to this row three small bristles and two heavier spiniform ones; above these ventral bristles a



broad lateral flap on the outer surface, bearing a row of small bristles which point downward (probably laterad in life); above this lobe the segment convex, bearing on the inner side at the dorsal margin a patch of small bristles. The armature of the ejaculatory duct differs from that of *St. robinsoni*, particularly in the ventral apical sclerite being longer, acuminate, finger-like.

♀. The sinus of the seventh sternite (fig. 7, vii. st.) larger than in *St. robinsoni* ♀, more triangular, the ventral margin of the upper lobe more slanting.

Head of receptaculum seminis narrower than in *St. robinsoni*, but as the organ varies in *St. robinsoni*, the difference can hardly be expected to hold good.

Length ♂ 2.4 mm., ♀ 3.4 mm.

One pair from Mt. Dulit, off *Sciurus brookei*.